

REMARKS

In the Office Action dated March 27, 2007, the improper restriction between the claims of Group I claims 1-20, and Group II claims 21-41, was repeated, together with an erroneous explanation for the basis of the restrictions. Applicants vigorously disagree with the restriction and cite the Office's expanded explanation at page 2 as further support for their objection. For example, the statement that "the step of an ionization of impurity atoms and molecules in their collisions with particles can be ... detected by a laser" is both unsupported and highly speculative. A document supporting the use of a laser as a device for detection of ionization step is respectfully solicited. Regardless, Applicants explicitly use UV light everywhere in this application (claims 9,10,15,29,30,35,41) and laser radiation (claims 8, 28) . Thus Examiner's mention of UV light doesn't form "another and materially different device" as required by MPEP #806.05(e). Reconsideration is requested.

The Specification was objected to because of the length of the Abstract which became expanded during the translation from Russian to English. A new Abstract is attached.

Sun et al. (U.S. Patent No. 6,225,633) is directed to a non-specific photo-ionization detection (PID) as would be used to meet OSHA requirements for confirmed space entry and other operations in the chemical industries. The PID has a conventional UV light source shining between an anode and a cathode. A voltage is imposed between the plates and a current is measured when an ionizable gas is introduced, but the Sun et al. device is non-specific and is unable to discriminate between various gas species. Sun et al. only tells you that there is some ionizable gas at the bottom of a manhole tunnel and

that a prudent person would vent the space before entering. Sun et al. cannot distinguish methane from hydrogen sulfide, despite their very different health and safety hazardous properties.

Claims 21-23, 31-35 and 37-41 have been rejected as anticipated by the aforementioned Sun et al. reference. No proper basis is found for such a comparison. Applicants' claim 21 specifies an ionization chamber having specific and restrictive characteristics:

1) "Geometry being chosen in such that a distance from any point inside of said ionization chamber to the nearest chamber wall or one of said electrodes is less than a mean displacement of electrons before they lose the chosen portion of their kinetic energy," and

2) "An equipotential space ...where said impurities ionization occurs."

The significance of the first limitation may be found at paragraphs [0043] of the specification, and was the subject of original independent claim 1. The equipotential space is discussed in paragraph [0043], [0045] and [0057]. Spatial distribution of electric potential is illustrated in Fig. 1 (note curve 8) and was also addressed in original independent claim 1.

The citation of Sun et al. at Col. 4, lines 33-50 says nothing about an equipotential space or gas pressure in relation to ionization chamber geometry and electrons energy relaxation length (i.e., "a mean displacement of an electron before it loses a given portion of its kinetic energy" according to feature (a) claim 21 of the present application).

It is clear from Fig. 3, 5A, 58 and patent specification (Col. 5, lines 9-16) of Sun et al., that a significant electric field is applied between bias electrode 50 and measurement electrode 52 to attract positive ions. So, the space between electrodes 50 and 52 of Sun

et al., where ionization occurs, is not equipotential and electrons energy cannot be measured there. Compared with Sun et al., the feature (b) of Claim 21 of present application teaches the equipotential ionization space and precise electrons energy measurements.

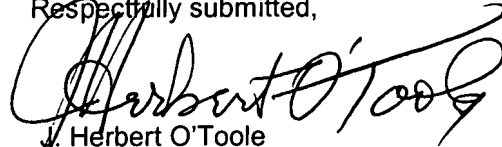
The Office finds, at Sun et al., "a measuring circuit. .. wherein said measuring system is capable of determining the amount of electrons with characteristic energies produced ... " (page 4, lines 1-5 from bottom of the Office Action). To the contrary, one cannot find in Sun et al. any word about "determining the amount of electrons with characteristic energies" (i.e., electrons energy analysis). Sun et al. measure unresolved total photo-current only and do not teach anything about electrons energy measurement. However electrons energy analysis is the feature (d) claim 21 of the present application.

Claim 25 has been rejected under 35 USC 103(a) over Sun et al. in view of Tooru et al., United States Patent No. 5,300,577. The Tooru reference is chosen to document the use of the second derivative of a sensible response as a form of curve smoothing. The claim, however, is dependent upon an allowable claim 21 and addresses a refinement thereof. The allowability of claim 21 is determinative.

The invention claimed by applicants relates to a sophisticated detector for trace gases which is based upon the creation and energy measurement of charged particles which do not lose a critical portion of their kinetic energy before being detected. Hence their uniqueness; chemical identification is achieved. The Sun reference instrument merely responds to anything which is ionizable as seen by its method of calibration. Additionally, the cell geometry according to claim 41 of the present application provides a larger signal to noise ratio due to much more solid angle between discharge and ionization chambers.

In view of the remarks above and the attached Abstract, Applicants submit that the application is in condition for allowance and request reconsideration and favorable action thereon.

Respectfully submitted,



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Enclosures: Replacement Abstract

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